

1997 MOM Award Winners

The 1997 Texas Watch Annual Meeting of the Monitors, held in Austin March 21-23, was a great success. While the summer issue of Texas Watch will feature an in-depth look at the activities and events that took place during the conference, this month we did want to recognize those volunteers and partners that received awards for their contributions to environmental monitoring over the last year. *Congratulations!*



Representing Panola College, Darrell Hudson, Becky Gullette, and Rhonda Bozeman accept their Outstanding Educational Group award from Texas Watch Advisor Mary Ann Neely.



Marshall High School students Tessia Brixey & Kelly McCann, and Teacher/Mentor Peggy Byassee accept their Outstanding Educational Group award from Mary Ann Neely.

Outstanding Group Overall

San Gabriel River Watch / Georgetown

Outstanding Group Application of Data

San Marcos River Rangers / San Marcos

Outstanding Volunteer Overall

Jo Meaker / Tascosa High School, Amarillo

Outstanding General Partner

Sabine River Authority

Lower Rio Grande Valley Devlpmt. Board / McAllen

Texas Watch Staff Recognition

Anne Rogers / former Texas Watch Volunteer Coord.

Beth Davis / former Texas Watch NPS Specialist

Outstanding Monitor

Bob Scott / Tarrant Coalition for
Environmental Awareness

Outstanding Lead Partner

Caddo Lake Institute / Texarkana

Outstanding Industry Partner

Eastman Chemical Company / Longview

Outstanding Volunteer Use of Data

Cynthia Lopez /

Rio Bravo River Watchers, El Paso

Outstanding Trainer

Mike Hernandez / Brazos River Authority

Outstanding Texas Watch Advisor

Mary Ann Neely / Current President

Outstanding Volunteer Support

Ellen Groth / Upper Colorado River Authority

Most Innovative Monitoring Effort

Trinity River Authority (for training videos)

Houston Galveston Area Council (for use of Internet)

Outstanding TNRCC Regional Support Staff

Glenn Morris / Region 1 (Amarillo)

Nadine Hall / Region 15 (Harlingen)

Outstanding Educational Group

Kelly High School / Beaumont

Panola College / Carthage

Marshall High School / Marshall

This issue.....

With Spring upon us and the gardening and lawn care season already in full swing, this issue's feature stories take a look at some things you can do around the yard to reduce NPS pollution, and will explain how the use of certain pesticides can so dramatically impact our ecosystem. Also in this month's Profiles & Perspective series, two monitors with the San Marcos River Rangers provide us insight into how and why the group got started, and where they are today.

WHAT'S INSIDE...

Composting: Helping to Reduce NPS pollution	2
Pesticides & Bio-Magnification	3
NPS & Texas Watch (part II)	6
What are BMPs ?	7
Profile: San Marcos River Rangers	8
Events & Announcements	10
Regional NPS Workshop Review	11
The 1997 Great American Secchi Dip-In	11
Wetlands: What is their purpose?	12
Bug Watch Begins in Beaumont	13
Rio Bravo River Watchers Receive Grant	14
About Texas Watch	16

COMPOSTING: How leaves, lawn clippings and kitchen scraps can help reduce NPS pollution

TNRCC'S Community Recycling and Composting Section

The Problem

Every spring in suburban neighborhoods throughout Texas, a war begins. The battlefields are typical Texas yards, where each year homeowners pour more than four million pounds of insecticides, herbicides, and fertilizers on their lawns and gardens. As the battles rage for the greenest, most weed-free lot on the block, more chemicals are applied per square inch to Texas' yards than to the most intensely sprayed farmland. Unfortunately, the casualty of this chemical warfare may be the water quality of nearby streams, rivers, lakes and ponds, where the runoff from over-fertilized and pesticide treated lawns ultimately collects.

It is also not uncommon for other backyard by-products, including lawn clippings, leaves, and branches, to end up finding their way into nearby, streams, ponds, and storm drains. Besides contributing to the problem of nonpoint source (NPS) pollution, when these yard trimmings begin to decompose in surface waters, the increased microbial activity robs the water of oxygen that is needed by other aquatic life. Even when disposed of through community waste disposal programs, yard trimmings often end up taking up valuable space in the local landfill.

Almost 5.5 million tons of yard trimmings and food waste are thrown away by Texans each year, accounting for over one-quarter of all the trash that ends up in municipal landfills.

The Solution:

Instead of ending up in a storm drain or the local landfill, most of this material can be put back to use as a soil-stabilizing mulch or compost - helping to reduce NPS pollution instead of contributing to it. Through the natural process of composting, yard wastes such as grass clippings, leaves, twigs, and wood chips, along with vegetable and fruit scraps, can easily be turned into a rich soil amendment beneficial for a variety of purposes.

As nature's way of recycling, composting involves the breaking down of organic waste by bacteria, fungi, microbes, and insects into a crumbly, dark-brown humus material with soil-like texture. If you are a gardener, you may already experience the benefits of compost and mulch in your flower beds, but you may not realize the larger role that these organic products play in environmental quality and NPS reduction.

When added to existing soil, compost and mulch protect soils from erosion and compaction while providing nutrients that reduce the

COMPOSTING *continued*

need for chemical fertilizers. The increased organic matter also attracts and supports beneficial microbes, helping plants fight off disease and fungus, and thereby reducing the need for pesticides. Because compost actually improves the overall soil structure, water penetrates easier and runoff is reduced. As an added benefit, the organic matter increases the soil's ability to retain water, so that less watering is needed to maintain a healthy yard and garden. Composting can also reduce the volume of yard waste requiring disposal, and as more communities face rising disposal costs and the loss of landfill space, reusing organic materials makes both environmental and economic sense.

Mulching has many of the same benefits as composting, and can achieve even greater reductions in runoff, watering requirements, and lawn chemical needs. Good mulches, including wood chips, leaves, grass clippings, and compost, can benefit both lawns and gardens by preventing erosion, suppressing weeds, retaining soil moisture, moderating soil temperature, and adding nutrients as they break down slowly. By using compost and mulch, you prevent pollution and promote water conservation, while saving money through lower water bills and less fertilizer and pesticide purchases. Best of all, composting is easy!

So remember, the next time you bury that banana peel in your compost pile or spread mulch on your garden, you are not only helping your plants, you are also playing a critical role in reducing waste, preventing NPS pollution, and protecting our state's valuable natural resources.

Easy, no-cost compost recipe

1. Pick a 4-foot by 8-foot area, preferably shaded, where water does not collect when it rains.
 2. Cover half the area with a 6-inch layer of leaves. Water thoroughly.
 3. Add a 2-inch layer of grass clippings and/or fruit and vegetable scraps, and add a dash of soil.
 4. Mix this layer lightly with the layer below it with a hoe or cultivator. Water thoroughly.
 5. Top with a 2-inch layer of leaves.
 6. Repeat steps 3 through 5 as ingredients are available.
- Note: The top layer of the completed pile should be at least 4 inches of leaves covering all food materials. Build the pile to 3 feet high as soon as you can.*
7. Turn the whole pile over with a hay fork or shovel every 2 to 3 weeks, adding water as needed to make the whole pile moist like a wrung-out sponge.
 8. Compost is done when most of the original ingredients have broken down and it smells like rich soil.

Tips for an environmentally friendly yard and garden:

- Let your grass fall to the turf as you mow. The clippings will act as a mulch reducing the water and fertilizer needs of your entire yard.
- Choose native plants that require less water, fertilizer, or pesticides, to decrease the amount of runoff from your yard.
- Position sprinklers to water only plants, not sidewalks, streets, or patios.
- Use natural alternatives to chemical pesticides or fertilizers whenever possible. If you do use chemical fertilizers or pesticides, follow the directions carefully and use only the amount recommended.

Clean Texas 2000 Composting Programs

The use of compost and mulch plays such an important role in protecting water quality and quantity, that the TNRCC's Office of Pollution Prevention and Recycling was awarded an EPA Section 319(h) grant for reducing NPS pollution. The grant helped launch the Clean Texas 2000 Master Composter and Centralized Composting programs.

The Master Composter Program

Clean Texas 2000, an environmental partnership program of the TNRCC, promotes mulching and composting as important ways for the state to reach the agency's goal of reducing waste going to Texas landfills by 50 percent.

The Clean Texas 2000 Master Composter Training Program helps local communities recruit and train volunteers to promote backyard composting and source reduction in their communities. It is open to anyone interested in learning how to compost and will provide individuals with the information needed to recycle their waste successfully.

Aspiring Master Composers receive 20 hours of training on appropriate yard trimmings management options, including backyard composting, source reduction programs like "Don't Bag It®," and centralized composting. Training includes the biology of composting, compost systems and techniques, compost troubleshooting, equipment and bin selection, and effective

continued on page 14

BIO MAGNIFICATION: What Comes Around Goes Around

Greg Rogers, Texas Watch Aquatic Scientist

In a previous issue of *Texas Watch*, you read about the nitrogen cycle and how excessive use of fertilizer can cause a water body to be over-productive with plants and algae, robbing the water of its dissolved oxygen. This example is only one of the ways human intrusion has affected biochemical cycles. The widespread application of pesticides, which includes insecticides and herbicides, has gained media attention over the years due to the drastic and surprising effects they have had on biochemical cycles. Of all these types of NPS compounds, perhaps none is more well known than DDT.

DDT & the Food Chain

The chlorinated hydrocarbon "2,2-Bi-(p-chlorophenyl)-1,1,1-trichloroethane," commonly known as DDT, was thought to be the insecticide that would eradicate the deadly disease malaria that is spread by the *Anopheles* mosquito. Beginning in the 1940's, DDT was administered throughout the world to control mosquito populations as well as other insects. Unfortunately the insects began showing signs of resistance to the compound and new forms of control became necessary. Over time, unexpected environmental effects caused by the use of DDT and its successors also became evident.

DDT and other chlorinated hydrocarbons have certain characteristics that make them subject to a process called biological magnification. This means the chlorinated

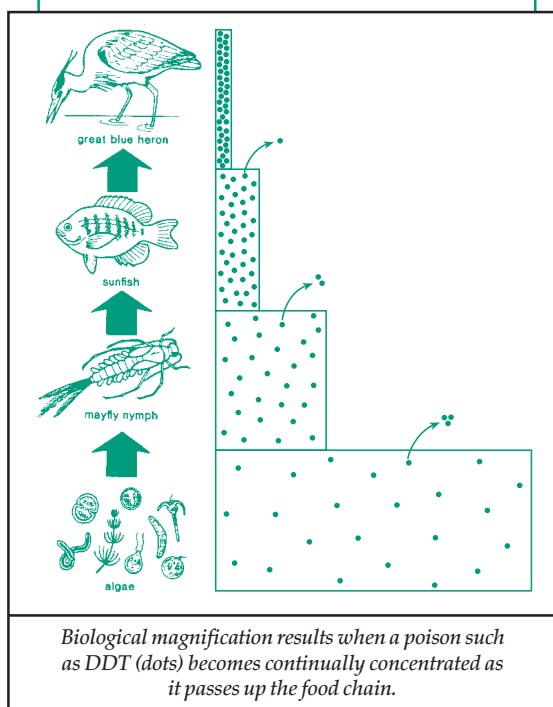
hydrocarbons actually accumulate in the tissues of animals at the top of the food chain in greater concentration than the compounds are found in the environment. Decomposers are unable to break these chemicals down and because they are highly soluble in fat and poorly soluble in water they tend to accumulate in the fat cells of plants

or links from the bottom to the top of the chain than there are in terrestrial food chains. This is why large fish-eating birds such as the bald eagle were so impacted by DDT.

From Algae to Eagles

Sprayed on forests and croplands, DDT eventually washed into streams and rivers through rainfall runoff. Once there, the insecticide was taken up by algae and diatoms and deposited in their lipids or fats. In the next link of the chain, a series of zooplankton and aquatic insects fed on the algae, taking in the pesticide, and because they are unable to excrete it, the chemical built up in their fat cells in larger concentration than in the algae. This process continued as the insects were eaten by little fish, who in turn were eaten by bigger fish.

Since eagles occupy a position at the top of the food chain, they eventually caught and ate some of the bigger fish. As with the other links, the increasingly concentrated pesticide was deposited in the fat cells of the large bird. Because the egg-producing part of the bird is primarily composed of fat cells, the presence of the accumulated pesticide caused the eagle egg shells to become thin, weak, and easily broken. The inability of many of these affected eggs to survive full-term resulted in the dramatic decline of not only the bald eagle, but the peregrine falcon, blue heron, and brown pelican as well. According to the U.S. Fish and Wildlife Service, in some cases DDT



and animals. This results in the chemical becoming increasingly concentrated as it passes from the bottom (the producers) of the food chain to the top (tertiary consumers).

As the accompanying diagram illustrates, a pesticide (dots) such as DDT that is minimally excreted (arrows) becomes more and more concentrated as it moves up the food chain. Biological magnification is more likely to occur in aquatic food chains because there are more steps

BIO MAGNIFICATION: What Comes Around Goes Around *continued*

had bio-magnified 10 million times by the time it had reached these large birds at the top of the food chain.

Although fish-eating bird populations were the most visible victims of bio-magnification, the adverse effects of DDT on aquatic life and other fish-eating animals may never be fully known. The recognition of this widespread and persistent environmental contamination caused by DDT, including its detection in animals as far away as Antarctica, resulted in most industrialized countries banning its use in the early 1970's.

Other Effects

Another chemically induced surprise resulted when the herbicide 2-4D was first applied to cornfields. Although introduced to control weeds, it was later determined that the herbicide also influenced the established nutrient cycle by altering the chemical composition of the growing corn. This alteration caused an increase in the nitrogen content of the corn, which improved the nutritional quality of the leaves. The outcome was a corn aphid population that increased to numbers three times larger than normal, with female aphids growing one-third larger in size and laying one-third more eggs.

Besides the potential of bio-magnification and chemical alteration, using pesticides to destroy certain populations of insects or plants can lead to a decrease in species diversity in surrounding areas. A serious reduction or loss of a local insect population for example, could lead to decreased bird and mammal populations that are dependent on them as a food source.

Extended and improper use of pesticides can also create counterproductive cycles that destroy beneficial insects and microorganisms, making it necessary to use even more chemicals to do the same job. In Texas today, an estimated one-third of home-use pesticides are wasted because more is used than needed. Overuse contributes not only to air, water, and soil pollution, but also wastes money, and places children, pets and users at increased risk.

So the next time you are applying pesticides or herbicides in your yard or garden, take time to remember these lessons. Be sure to follow the instructions carefully, and use them as sparingly as possible. Better yet, begin a yard maintenance program that includes proper watering and mowing, and use of mulch, compost, and xeriscaping. These techniques will not only greatly reduce the need for chemical pesticides and fertilizers, but will also go a long way toward reducing NPS pollution and the resulting problems.

As we have seen, the actions you take as a farmer, a rancher, or even a homeowner, can and do impact the biochemical cycles in ways you might never have imagined. The more clearly we understand how we are connected to the water, land, air, and life around us, the better we can foresee how our actions will affect the systems surrounding us. This improved awareness and our increasing ability to manage our environment more responsibly will ultimately benefit all living things.

*For more information on this subject, visit the U.S. Fish & Wildlife Service "Pesticides and Wildlife" web site at: <http://www.r6.fws.gov/www/fws/feature/pesticid.html>. **

COMPOSTING: Helping to reduce NPS pollution *continued from page 3*

community outreach. To receive full certification, Master Composter trainees must also commit to spending 20 volunteer hours teaching others about composting.

As guidance for Master Composers, the TNRCC offers several publications. For volunteers, the Master Composter Training Manual is available to explain the specifics about backyard composting. The Master Composter Program Planning Guide helps community leaders establish a viable composting program. One-page Environmental Bulletins are also available on Mulching and Composting as well as Worm Composting. The TNRCC has also put together a program of short workshops that Master Composers can use as an outreach tool.

Large-Scale Centralized Composting

With the assistance of the TNRCC's Centralized Composting program, increasing numbers of cities and private programs around the state are collecting yard trimmings, food, and other organic material to compost or mulch at centralized sites. Some of the more interesting materials that are being composted include out-of-date picante sauce, dish washing detergent, soft drinks, beer, and wine. The U.S. Post Office, in partnership with the Composting Council, plans to recycle about 25 tons of undeliverable bulk mail by composting it. In Austin, a co-composting facility operated by the city's wastewater department, combines municipal sewage sludge

continued on page 14

Nonpoint Source Pollution and Texas Watch (Part II)

Thom McInnis, Texas Watch NPS Projects Coordinator

Through the diligent efforts of our many monitors and partners, Texas Watch has been actively monitoring for nonpoint source (NPS) pollution since 1992. In fact, a major portion of funding for Texas Watch programs is provided through Section 319(h) grants awarded by the EPA. Section 319 of the Clean Water Act provides for national NPS water pollution prevention and control programs that identify water quality problems and develop and implement management strategies to address them. These funds are used to support programs and projects that have the greatest likelihood of producing water quality benefits, while encouraging effective performance and cooperative relationships.

Texas Watch currently administers or assists on five of the more than sixty 319(h) NPS grants in progress at the TNRCC. These grants charge Texas Watch staff, partners, and citizen monitors with the responsibility of monitoring our streams, lakes, and bays for NPS pollution, while educating communities about their environmental and health effects.

Although Texas Watch supports monitoring activities statewide, currently Texas Watch staff are focusing on recruiting and training monitors in specific 319(h) project areas. In the last issue of *Texas Watch*, the East Bouldin Creek Best Management Practices Implementation and

Evaluation Project taking place in Austin was profiled. In this issue, we will take a closer look at the other 319(h) project areas and activities in which Texas Watch is involved.

Statewide Urban NPS Pollution Prevention Project

In this project, Texas Watch is moving into smaller communities surrounding the four pilot cities of an earlier grant: Beaumont, Harlingen,

mentation of non-structural Best Management Practices (BMPs) designed to reduce and prevent NPS pollution in their communities. Volunteers are also being recruited to monitor water quality through a newly implemented biological monitoring program. The data they collect will be central to measuring and documenting water quality improvements and *estimated NPS load reductions*.

Public Education Through Citizen Volunteer Participation in Various Learning Projects

Through this project, communities in the Lower Rio Grande Valley are learning how they can work together to prevent pollutants such as oil and grease, erosion sediment, pesticides, fecal coliform, and other NPS pollutants from reaching nearby streams, the Rio Grande,

and resacas (ox-bow lakes). This project is educating the public about NPS pollution through educational outreach, participatory learning, and implementation of non-structural BMPs. Planned activities include storm drain stenciling, streambank and resaca restoration, erosion control, and watershed mapping. Volunteers are also being recruited to monitor water quality and collect



New storm drain stencil in Brownsville, part of the Lower Rio Grande Valley outreach and education project.

Lubbock, and Fort Worth. In addition, Texas Watch will be active in communities of the Corpus Christi Bay and Galveston Bay watersheds. The goal of the statewide project is to maximize the benefits of the pilot project by creating more regional awareness of NPS pollution, and by *initiating comparable monitoring designs*.

A major focus of this grant is public education. Citizens and business participants are being recruited and educated in the imple-

continued on page 7

Nonpoint Source Pollution and Texas Watch (Part II) *continued*

data that will be used to measure and document water quality improvements and estimated NPS load reductions.

Texas Watch Watershed/Nonpoint Source Technology Transfer and Education Project:

Along with the statewide Meetings of the Monitors conference held in Austin in March, this project requires Texas Watch to conduct a series of regional workshops focusing on NPS pollution issues, management strategies, and technological practices. Watersheds with known NPS impacts are being targeted to host these regional activities, with the first of these workshops taking place this past January in Longview (see accompanying article in this issue.)

Through these workshops, Texas Watch will develop and strengthen partnerships with area businesses, resource managers, and government agencies to support citizen monitoring and other NPS prevention activities. The *Texas Watch* quarterly newsletter is also funded under this grant, providing educational articles and reports on volunteer and partner activities.

Brazos and Sabine Groundwater and Surface Water NPS Project (FY92):

In this project, TNRCC is attempting to address NPS pollution on a watershed scale. Texas Watch is one of three components of this project. The other two provide a comprehensive approach to the control of nutrient and fecal coliform contamination from dairy operations in both ground and surface water resources. These dairies will be asked to implement BMPs to prevent NPS impacts on ground and surface water quality. Texas Watch monitors will collect data that will be used to assess the effectiveness of these BMPs and changes in water quality. This will be done by sampling for fecal coliform bacteria, nitrate-nitrogen, and orthophosphates as well as the core Texas Watch variables.

Measures of Success

The success of these projects is measured in two ways. The first measure is whether they accomplish what they set out to do. Did we see improvement in water quality? Did we recruit enough volunteers? Are we meeting the data collection requirements prescribed by the grant?

The second and probably most important measure is whether the new techniques and protocols being developed are appropriate for other, non-project areas. Are volunteers excited about the activities and are the partners willing to support them? When these questions are answered, and a new activity is determined a success, Texas Watch can then consider disseminating it to volunteers statewide.

*(Author's note: Portions of this article were obtained from EPA Document 841-F-96-004A and TNRCC NPS Program Document "Summaries of Projects Funded under the Federal Clean Water Act, Section 319(h) for Nonpoint Source Pollution Prevention and Abatement.") **

What Is a Best Management Practice?

Best Management Practices (BMPs) are pollution controls for NPS pollution. BMPs consist of structural or non-structural systems that can be implemented or installed to prevent NPS pollution.

Examples of structural BMPs include: sedimentation ponds designed to collect sediment running off urbanized areas, temporary silt fences erected at construction sites, and wastewater lagoons constructed to collect dairy animal wastes.

Examples of non-structural BMPs include: vegetation buffers between streams and agricultural fields, revegetation of eroded stream banks to hold soil, local ordinances requiring silt fences at construction sites, and public education campaigns to encourage less use of lawn fertilizers.

PROFILES & PERSPECTIVES

This month, Texas Watch takes a look at the San Marcos River Rangers, one of our 1997 Meeting of the Monitor award winners. The River Rangers are a small independent group currently monitoring 15 sites on the San Marcos River, in and around San Marcos, Texas. In the following articles, two members of the group give their perspectives on how the group got started, and where they are today.

San Marcos River Rangers

Mary Beth Garret, San Marcos River Rangers Monitoring Coordinator

San Marcos Springs bubbles up from a deep, porous formation of limestone to form the gentle San Marcos River. This unique river sparkles its way right through downtown San Marcos, and archeologists tell us that humans have continually depended on this resource for centuries. Today, as our small city braces itself for a population surge, many of us wonder how to preserve the natural beauty of the river for future generations? If the people living near the river feel estranged from it, the river will likely be left uncared for and degraded. After all, humans naturally take better care of what they feel connected to and value. This is where the San Marcos River Rangers come into the picture. Our mission: to promote a sense of connectedness between the people and river.

It all started with a group of casual friends and a newcomer to town (myself), 10 testing sites, and three Texas Watch test kits purchased by the San Marcos River Foundation. Our Volunteer Coordinator, Alex Thomas, founded the group after seeing first hand the importance of Texas Watch monitoring data in a wastewater permit hearing for the San Marcos River. Like most newly formed groups, we struggled at first to become organized. Deciding who would do what, when, and how were our greatest challenges. But we

persevered, and through the gradual process of trial and error, we organized ourselves.

Today, over a year and a half later, the group runs efficiently with only an occasional "snag." Our

original group of eight monitors has grown to 25, with 15 testing sites stretching several miles along the San Marcos River. We have added phosphate and nitrate testing, and all our kits and supplies are funded by the San Marcos River Foundation. We have an equipment manager, a data manager, two quality assurance officers, four "weekend crew-chiefs," two trainers, a volunteer coordinator and even our own t-shirt. We pass our quality assurance sessions and keep up with our quarterly duplicates. Our data, along with maps of our testing sites, are posted for public view at several businesses in town. (I occasionally receive a personal phone call from a community member who noticed our data). We also have a "Monitor of the Month" program which features a different monitor each month in the local newspaper.

We are continuing to expand our monitoring procedures by creating a database to be used in a geographic information system (GIS). We are also working on a habitat assessment plan to enhance our field observations.

The San Marcos River Rangers are a successful group. We promote a sense of connectedness to the river through our hard work and community outreach. We are continually growing in our number of certified monitors, our ideas, and our accomplishments. The River Rangers are sincerely committed individuals who give generously of their time and energy for a meaningful and long-term cause – our river.



Beth Trout, a San Marcos River Ranger volunteer, monitors the river near San Marcos.

In nature there is neither praise nor blame; but there are consequences.

- Anonymous

San Marcos River Rangers *continued*

Getting Started

In the following interview (reprinted from the Spring 1996 issue of "The Volunteer Monitor"), Alex Thomas, one of the founding members of the River Ranger describes the group's beginnings.

How did you get the idea of starting River Rangers?

In 1995, I was part of a group of citizens contesting a wastewater plant discharge permit. The city of San Marcos had applied for a permit to increase wastewater discharge without upgrading standards and without treating for phosphorus. (The citizens eventually won after a lengthy and expensive battle, but that's another story.)

At one public hearing on this issue, the hardest data I saw came from a monitoring group that had been bracketing the discharge site, testing just above the wastewater plant and right below it. I was so impressed that I decided to organize a group to test the river at more points, and more often.

Who helped you get started?

The Texas Watch program provided training, and gave us a model. They set the path which we are following. The San Marcos River Foundation provided funding for test kits and helped us pick our test sites. Their knowledge about local issues and specific threats to the river helped focus our efforts.

Have you gotten funding from other sources?

We held a benefit concert that raised about \$200, and we've received some private donations. Our expenses are pretty low because we're an all-volunteer organization.

Did you have in mind specific uses for the data?

Yes. We wanted to present our data to municipalities and state agencies; we wanted to share it with school kids; and we wanted to contribute to baseline data. Basically we wanted to help build a picture of the San Marcos River.

What questions did you want to answer?

The core concern of our monitoring efforts is to build a river profile over a period of time. Additionally, we want to find out what specific nonpoint source pollutants are reaching the river, how these pollutants move down the river, and how they change over time and space. We're especially interested in sediments, fecal coliforms, and petrocarbons (which could indicate road runoff).

How did you decide what parameters to monitor?

We started with the basic Texas Watch kit, and we added testing for phosphorus, nitrates, and fecal coliforms at specific sites where these parameters are important - for example a site near a fish hatchery, which has a nutrient-rich discharge.

What challenges did you face in getting started?

At first some volunteers, especially those who are students, were not totally reliable (though they were high on enthusiasm and energy). This problem was resolved when a core group of the most committed volunteers talked to them, asked what the problem was, and reinforced that "this is serious, the protocols are important."

Some people wanted the River Rangers to take a political stand for

zero discharge, and others did not. In our meeting we discussed what this group is about, which is monitoring. We agreed that members can work on other projects too, but not in the name of the group. For this group, the most important thing is to get the job done - that is, to collect data.

Any advice for others starting a volunteer monitoring program?

It is important to be clear about your goals, and the nature of the commitment you need from volunteers. We're not an "Earth First!" group, and we're not a coffee club for talking. We are focused on a particular activity. Once the group's focus is agreed on, many different types of people can work together.

Don't bring too many volunteers too fast. Everyone wants to be a monitor, but not all have the necessary commitment. Also, you need to train and organize new volunteers, the leaders quickly wind up spending up to eight to 10 hours a week on the project.

Finally, never underestimate how much fun it is, and how important it is.

(The preceding article first appeared in "The Volunteer Monitor, the National Newsletter of Volunteer Water Quality Monitoring," and is reprinted with their permission. For reprint or subscription information, contact Eleanor Ely at (415)255-8049.

*Mary Beth Garrett can be reached through the San Marcos River Foundation, P.O. Box 20021, San Marcos, TX 78666. Alex Thomas can be contacted at 2502-B Hwy 80, San Marcos, TX 78666; (512)357-6023. **

Events & Announcements

You Can Help Support Volunteer Environmental Monitoring!

Here's a simple way you can help support environmental monitoring. Every time you shop at Randalls Food Stores, a portion of your grocery bill can be donated to the Texas Conservation Fund (TCF) to support groups and individuals who are monitoring with Texas Watch. Here's all you do:

1. Whenever you make a purchase at Randalls, present the cashier with your Randalls Remarkable Card. Randalls Remarkable Card is a free courtesy card (not a credit card) that saves you money through discounts and other offers. Your free Remarkable Card can be obtained at any Randalls customer service desk.

2. Tell the cashier that you want to donate to the TCF's Texas Watch account, #1410.

That's it! Once you designate Texas Watch for your contributions, from then on, every time you present your Remarkable Card at check out, a portion of your bill will be automatically donated to support volunteer monitoring activities. The funds will be managed through the Texas Conservation Fund, a non-profit organization, and will help pay for monitoring supplies, educational materials, and other services.

Teaching Environmental Sciences Training Courses Offered

The TNRCC's Education Resource Section has announced its summer 1997 schedule for their popular Teaching Environmental Sciences (TES) graduate course for elementary teachers. The course offers free tuition to teachers of grades K-6, three hours of graduate credit, full TEEAC certification (45 hours), plus speaker presentations, field trips, and hands-on activities related to air, water and waste issues. Teachers also receive an extensive array of educational materials related to environmental topics.

This year the 10-day course will be offered during June and July at nine different university sites. Locations include: Lamar University at Beaumont, Texas A & M University at Corpus Christi, University of Texas at El Paso, University of Houston at Clear Lake, Stephen F. Austin State University in Nacogdoches, Texas Southern University in Houston, Southwest Texas State University in San Marcos, Texas Tech University in Lubbock, and University of North Texas in Denton.

Inquiries about TES can be made by calling (512) 239-0012, or write: Education Resources, MC 113, TNRCC, P. O. Box 13087, Austin, TX 78711-3087. Each class is limited to 25 teachers, so call or write soon.

Watershed Maps Available

The Watershed Delineation maps that Texas Watch displays every year at the Meeting of the Monitors are now available for purchase from the TNRCC. These maps are great for use in the classroom or for anyone who wants to know more about the watersheds of our state.

You can purchase the Meeting of the Monitors / Watershed Delineation maps or any other TNRCC-produced map by writing to Barry Allison, Information Resources Division, MC-197, TNRCC, P.O. Box 13087, Austin, TX, 78711-3087. Provide a description the map that you want to order and include your mailing address and phone number. The maps cost \$26.00 per hour to produce, plus shipping charges. The Watershed Delineation maps should be reproducible within one hour, but other maps may take longer and cost more. Upon completion, the agency will invoice you for all charges, and after receiving full payment, the maps will be mailed. If you need further information, please call Barry at (512)239-3850.

continued on page 15

Regional Workshop Takes a "Long View" at NPS Pollution

Eric Mendelman, Texas Watch Team Leader

Nonpoint source pollution (NPS), its sources and solutions, was the topic of the day in Longview, Texas on Saturday, January 18. Hosted by Texas Watch partner Eastman Chemical, the meeting focused on watersheds in North and East Texas - the Canadian, Red, Sulphur, Cypress, Sabine, Angelina, and Neches Basins. Fifteen speakers filled the agenda, presenting summaries of NPS issues and educational activities in each basin. River authority representatives provided water quality information, describing such NPS problems as salinity in the Red River Basin, oil rig waste in the Sabine Basin, and poultry litter in the Angelina and Neches Basins.

Presentations by local council of governments, students and teachers, river authorities, and Texas Watch staff focused on educational strategies to address NPS problems. Successful programs at Karnac, Marshall, and Queen City High Schools, and Panola and Texarkana college were highlighted, along with the Art-Tex Council of Governments' monitoring activities and solid waste programs. Additional topics included use of the Internet, wetlands construction to study water quality and geography, international information exchanges, benthic macroinvertebrate sampling, funding for high school teachers, and storm drain stenciling. Tom McAninch, Eastman Chemical host, provided the meeting space, lunch, and a guided tour of the Eastman Chemical plant, highlighting the plant's waste control technologies.

Many thanks to the volunteer monitors, students, teachers, and partners who attended and presented. And thanks to Tom McAninch and Eastman Chemical for giving us the time and place to take a long, educational view at NPS pollution. *

The 1997 Great American Secchi Dip-In

This summer marks the fourth year of the Great American Secchi Dip-In, an international effort in which volunteers produce a "snapshot" of transparency in lakes, reservoirs, estuaries, and rivers throughout North America. Sponsored by the North American Lake Management Society and the United States Environmental Protection Agency, the Dip-In is directed by Kent State University biologists Dr. Robert Carlson and Professor David Waller, and KSU geographer Dr. Jay Lee.

During the period from June 27 until July 13, 1997, it is estimated that more than 2,000 volunteer monitors from more than 30 states and Canadian provinces will measure transparency in their favorite lake, river, or

estuary using a "Secchi disk." The distinct black and white disk that is lowered into the water to measure transparency was developed more than 150 years ago by the Jesuit priest Pietro Angelo Secchi. The depth of the disk's disappearance is affected by the color of the water and by particles of silt, clay, or algae, and therefore is a measure of some forms of pollution.

Carlson started the Dip-In's because he wanted to find a way to produce a scientific picture of the water quality of the world's lakes. Such a project could only be done using thousands of volunteers who routinely measure transparency in local volunteer programs. In return, the event allows volunteers the

chance to contribute data that will form a picture of water transparency for all of North America.

The project also provides local monitoring programs the opportunity to increase their communities' awareness of water quality issues. In past years, the Dip-In has been covered by several national news services and interviews have been given on PBS and the BBC. Volunteer monitors have also been featured in local newspapers and TV news reports performing their measurements.

What's Been Learned

The previous three Dip-In's have provided valuable information and shown the considerable regional differences in transparency. Lakes in

continued on page 15

WETLANDS: What are they and what is their purpose?

Chris Loft, Texas Watch Aquatic Scientist

In the scientific view, wetlands are largely semi-aquatic lands that are flooded for varying periods of time during the growing season. When not flooded, wetland soils are often saturated near the land surface. They include tidal marshes and mudflats along the coast, freshwater marshes, swamps, bottomland hardwood forests, wet meadows, and ponds and bogs farther inland. Wetlands are generally defined by the predominance of hydrophytes (plants adapted for life in wet soils) and the presence of hydric soils (saturated or periodically flooded soils).

Long viewed as wastelands having little productive use to society and no direct economic value, wetlands were drained, cleared, and filled in for farmland, construction sites, and landfills. The drainage and destruction of wetlands continued to be the accepted and often encouraged practice in the United States until the mid-1970s. As a result, less than half of America's original wetlands remain. Since that time the public has begun to realize that wetlands are valuable systems providing many benefits to society. Wetlands are among the most productive natural ecosystems in the world. More than one-third of the federally endangered and threatened plants and animals require wetland habitats during some portion of their life cycle. Their most widely valued function is providing

habitat for fish, birds, and wildlife. In addition wetlands carry out hydrologic functions; improve water quality; and provide recreational, educational, research, and aesthetic functions.

Wetlands are required by many types of animals and plants for survival. For many (like the wood duck, muskrat, cattail and swamp rose), wetlands are their primary habitat. Many mammals (including beaver, otter, mink, raccoon, bobcat, moose, and white-tailed deer) use wetlands as feeding areas. Some of these animals are completely dependent on the wetland for sustenance. Wetlands are also valuable fish habitats. It is estimated that over one-half of all saltwater fish and shellfish harvested annually in the United States, and most of the freshwater game fish, use wetlands for feeding areas, spawning grounds, and nurseries for young.

Wetlands have often been referred to as natural sponges that absorb floodwaters; yet they actually function more like natural tubs by storing floodwaters. By providing storage, wetlands help protect adjacent and downstream property owners from flood damage. Trees and other wetland plants also slow the speed of floodwaters. This action along with water storage allows wetlands to lower flood heights and reduce the water's erosive potential.

Another important value of

wetlands is their ability to improve water quality by removing and transforming both organic and inorganic materials including human waste, toxic compounds, and metals from inflowing waters. Because wetlands are particularly good water filters, they are sometimes used in the wastewater treatment process. Many attributes, including the following examples, make wetlands effective in improving water quality.

- As waters enter a wetland, reduction in velocity causes sediments and attached pollutants to settle out.
- A variety of anaerobic and aerobic processes remove certain chemicals from the water.
- Vegetation in wetlands takes up minerals; later, when the vegetation dies, the minerals are buried in sediments, removing pollutants from the water.

As discussed above, wetlands play an active role in habitat support, hydrologic functions, water quality improvement, and recreational activities. Wetlands now receive protection under federal and state laws as well as local ordinances because of their recognized importance in providing environmental and economic benefits such as floodpeak reduction; shoreline stabilization; groundwater recharge; nutrient removal; and support of commercially important fish, shellfish, ducks, and geese. *

"Bug Watch" Begins in Beaumont

Greg Rogers, Texas Watch Aquatic Scientist

On November 23, 1996, the Lower Neches Valley Authority (LNVA), the Sabine River Authority (SRA), and the Southeast Texas Regional Planning Commission hosted the first Texas Watch Benthic Macroinvertebrate Training in the

"bugs." Because they need a certain level of water quality to survive, sampling for these insects can help determine water quality up to three months prior to the collection event. The lack of certain "bugs" and/or the proliferation of others, can be an

provided an opportunity for volunteers to learn how to collect and sort the "bugs" as well as score the habitat from which they were collected.

According to Mark Howard of the SRA, "The training was a huge success with more than 20 people

attending. The hope is that several biological monitors will be sampling soon."

Andrew Bruno of the LNVA is also excited about the new program. "The LNVA is looking forward to having volunteer biological monitoring conducted in the Lower Neches Basin. The Texas Watch volunteers will enable the LNVA to efficiently utilize its data gathering resources," Bruno said.

In the coming months, more biological trainings will be conducted in other pilot project areas of Austin, Lubbock, the Fort Worth/Dallas Metroplex,

the Corpus Christi area, and the Lower Rio Grande Valley. In the future, as the program is finalized and partner resources are further developed, Texas Watch hopes to be able to provide trainings in other areas of the state.

For more information on the Texas Watch biological monitoring program, contact Greg Rogers with the TNRCC's Texas Watch program at: (512) 239-4782; or e-mail at: glrogers@tnrcc.state.tx.us. *



Texas Watch Aquatic Scientist Greg Rogers demonstrates D-net and muddy bottom sampling techniques in Little Pine Bayou, part of Beaumont's first biological monitoring training.

Southeast Texas area. This new program is being implemented in pilot areas such as Beaumont to determine the effects of nonpoint source (NPS) pollution on the macroinvertebrate community and to evaluate the effectiveness of new Best Management Practices (BMPs).

Through this new biological monitoring program, volunteers were trained to evaluate the health of streams by examining macroinvertebrate aquatic insects or

indication that water quality is being negatively affected by NPS pollution.

The training session was divided into two parts, much like the phase I and phase II of the Texas Watch chemical training. During phase I training, volunteers learned about macroinvertebrates and their use as water quality indicators. The importance of conducting a thorough habitat assessment and the methods of scoring habitats were also covered during phase I. The phase II training

Rio Bravo River Watchers Awarded NAFEC Grant

Thom McInnis, Texas Watch NPS Project Coordinator

The Commission for Environmental Cooperation (CEC) recently announced that the Rio Bravo River Watchers were awarded over \$45,000 from the North American Fund For Environmental Cooperation (NAFEC) during their 1996 grant cycle. The grant request, authored by Cynthia Lopez, focuses on the empowerment of local communities as an essential aspect of environmental protection. According to Cynthia, most El Paso County and Valle de Juarez colonia residents who live in the Rio Grande/Rio Bravo floodplains come into contact with contaminated water from the river or shallow wells and have limited ability to improve these conditions. Using a Atrain-the-trainer@ approach, the Rio Bravo River Watchers will help communities acquire the skills to monitor water quality and effectively advocate for remediation and prevention. The Rio Bravo River Watch will partly achieve these goals by producing their own educational videos which will help the communities to improve their environment and their own sense of purpose.

The CEC was created by the North American Agreement on Environmental Cooperation to enhance regional cooperation, prevent potential environmental and trade disputes, and promote the effective enforcement of environmental laws. This agreement, signed by Canada, Mexico, and the United States, complements the environmental provisions established in the North American Free Trade Agreement (NAFTA).

The NAFEC seeks to support not-for-profit, non-governmental projects that are community based, and reflect cooperative and equitable partnerships between or among organizations from different regions and countries within North America. NAFEC supports projects that teach and strengthen local communities, organizations, and institutions with skills that emphasize environmental, social, and economic sustainability. Although funding will not be provided to government agencies, this should not preclude non-governmental organizations from collaborating with government agencies such as TNRCC/Texas Watch. More information on applying for NAFEC grant can be obtained by writing the Commission for Environmental Cooperation, 393 St.-Jacques West, Room 200, Montreal (Quebec) Canada, H2Y 1N9; or by calling (514) 350-4357.

Hats off to Cynthia Lopez and all the other Rio Bravo River Watchers who are setting the standard for all other Texas Watch groups to follow. *

COMPOSTING: Helping to reduce NPS pollution *continued from page 5*

with yard trimmings collected from residents and composts them into a beneficial soil amendment sold under the name "Dillo Dirt." The program, which diverts two materials that have historically been land filled, has become a huge success.

At the end of 1995, 153 cities and counties reported that they compost or mulch yard trimmings with more than 90 percent of these communities providing curbside collection. Twenty-six cities and counties are currently mixing

biosolids with yard trimmings and diverting over 400,000 tons of municipal sludge from Texas waterways for such beneficial uses as soil improvement in city parks and along roadways.

Additional Information

- To obtain more information on composting, the "Don't Bag It®," or the Master Composter programs, call the TNRCC Community Recycling and Composting Section at (512) 239-6750, or e-mail Christy Corse at ccorse@tnrcc.state.tx.us.

- To order publications about composting and yard care from the TNRCC, call 1-800-64-TEXAS and select the composting option.

- To locate your local Council of Government Solid Waste Coordinator for information on current Master Composter programs in your area, call the Texas Association of Regional Councils at (512) 478-4715.

- Visit the TNRCC Recycling Section's web page at: <http://www.tnrcc.state.tx.us/exec/oppr/recysec.html>. *

The 1997 Great American Secchi Dip-In

continued from page 11

the northern parts of the United States and in Canada typically have the clearest lakes, while lakes in agricultural regions have some of the smallest transparencies. The deepest transparency found so far during the Dip-In was 52 feet in a lake in Minnesota, while the shallowest measurement was just one inch of water in a Nebraska reservoir. As each year's data accumulates, it may be possible to see if the water transparency of different regions of the country is changing over time.

Equally valuable has been the information gleaned on the volunteer's perception of water quality. The Dip-In has found that opinions as to the meaning of water quality vary considerably from region to region. A person in Minnesota or Maine, for example, may think that a lake is degraded if the transparency is six feet, while in other states, a lake with a transparency of only a foot may be considered beautiful. But Carlson warns that because people become accustomed to the quality that they see every day, small, subtle changes can go unnoticed. Fortunately, with an increasing number of volunteers monitoring water quality nationwide, more and more of these changes are being recorded and recognized.

Volunteer monitors have also begun to change the perception of what is considered to be a water quality problem. Typically, those who study lakes think of problems as algal scums and weeds. Although the volunteers think these biological nuisances are important, a group of human-related problems are now being focused on. Volunteers are beginning to report that noise, boat congestion, rude boaters, and trash

are equally important water quality problems. Perhaps the biggest surprise is that jet-skis now equal or surpass algae and weeds as the chief perceived water quality problem in the United States. The volunteers' perceptions may not be a random sampling of water users, but they do remind us that aesthetics are an important part of our environmental consciousness.

How To Get Involved!

If you are currently taking Secchi measurements Texas Watch encourages you to become part of this year's Great American Secchi Dip-In. By the middle of June, all volunteers who currently include Secchi measurements on their Texas Watch monitoring forms will automatically be sent the information and data questionnaire necessary to participate in the Dip-In.

Additionally, any monitors who have access to a Secchi disk and wish to provide measurements from a local lake, river, or reservoir are also invited to participate. In order to submit data for the Dip-In from a location other than an approved Texas Watch site, you must be able to supply the latitude/longitude coordinates for where the measurement is taken. If you can provide the required information for additional sites and want to become involved, contact Greg Bryant or Michele Blair with Texas Watch at 512/239-4720, or e-mail txwatch@tnrcc.state.tx.us by June 1 to receive your Dip-In data questionnaire. If your group has participated in the event before, information on your program is being made available on the Dip-In web site at <http://humbolt.kent.edu/~dipin>. *

Events & Announcements

continued from page 10

Bravo!

Kyle Wilson, a teacher with the Pride Academic Center (PAC) and a volunteer with the school's monitoring group, PAC Hydrosphere Monitors, was formally elected to the Board of Directors of San Marcos River Foundation on February 9, after having served in an appointed capacity since 1996. Congratulations Kyle!

In addition, the PAC Hydrosphere Monitors have been asked by Southwest Texas State University to assist in the coordination of the university's wetlands exhibit planned at Aquarena Springs. The planned display consists of a boardwalk over the slough and a series of stations for educational information and bird watching. The wetlands exhibit will include flora and fauna native to the area.

New TNRCC Newsletter

The Texas Natural Resource Conservation Commission has launched *Natural Outlook*, a quarterly newsletter to help identify and raise public awareness of critical environmental issues to Texans. *Natural Outlook* provides leaders in business, industry, and government with the information they need to make key decisions.

To add your name to the mailing list, write to: *Natural Outlook* Editor, MC-194, TNRCC, P.O. Box 13087, Austin, TX 78711-3087, or telephone (512) 239-0010. You can also find *Natural Outlook* on the TNRCC web site: <http://www.tnrcc.state.tx.us>.

About Texas Watch

Texas Watch is a network of trained volunteers and supportive partners working together to help the TNRCC protect Texas' environment. Funded primarily through the federal Clean Water Act, Texas Watch trains students, teachers, and citizens to collect quality assured data and observations which can be used to assist professionals in developing local and regional management strategies. The purpose of the *Texas Watch* newsletter is to facilitate the exchange of information, ideas, and monitoring data between environ-

mental monitors and supporting partners throughout Texas.

Program Director - Eric Mendelman; *NPS Project Specialists* - Greg Rogers, Chris Loft; *Data Administrator* - Pat Davis; *Communications Coordinator / Editor* - Greg Bryant; *Volunteer Coordinator* - Michele Blair; *Special Projects* - Jane Sund, Tina Dacus.

Mailing address: TNRCC / Texas Watch, MC-150, P.O. Box 13087, Austin TX 78711-3087; *Phone:* (512)239-4720; *e-mail:* txwatch@tnrcc.state.tx.us; *web site:* <http://www.tnrcc.state.tx.us/txwatch>.

Subscribing – Texas Watch is published quarterly. For a free subscription, send your request to our postal or e-mail address, or access the Texas Watch web page.

Contributions – Contributions to the newsletter are welcome and encouraged. Please send any articles, letter or questions to Greg Bryant / Newsletter Editor at the above address.


Reprinting Articles – Reprinting material from *Texas Watch* is encouraged. Please notify the editor of intentions and send a copy of your final publication to the above address.

This newsletter is made possible through a grant from the Environmental Protection Agency (EPA).

The contents of this document do not necessarily represent the views of EPA or TNRCC.

This newsletter is compiled and written in the Water Planning and Assessment Division, with editorial and production assistance from the Agency Communications Division. Please contact Texas Watch at (512) 239-4720 if you have questions or comments about this publication, or if you would like to be added to the mailing list.

The TNRCC is an equal opportunity/affirmative action employer. The agency does not allow discrimination on the basis of race, color, religion, national origin, sex, disability, age, sexual orientation or veteran status.

 printed on recycled paper using soy-based ink



WATER QUALITY DIVISION/MC 150
TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION
PO BOX 13087
AUSTIN TX 78711-3087

BULK RATE
U.S. POSTAGE
PAID
AUSTIN, TEXAS
PERMIT NO. 1967